

Robert A. BREYER *et al.*
Atty. Docket 005242.00138
U.S. Patent Application Serial No. 10/671,885
(8624/US)

REMARKS

Claims 1-18 remain pending in this application.

Restriction

Applicants hereby affirm the election of the invention of Group I, claims 1-9, drawn to a wood composite, with traverse.

The Examiner justifies the restriction on the assertion that the process of claims 10-18 can be used as claimed to make a materially different product, specifically identifying “an article out of fine sand particles and suitable glue.” This assertion has no basis in fact.

Claim 10 is the only independent process claim and it specifically recites:

A process for making a wood composite comprising applying an adhesive binder composition to a source of wood material, the adhesive binder composition comprising a urea-formaldehyde resin modified with a protein, said protein provided in an amount of 0.1% to 10% by weight of resin solids, consolidating said wood material and curing said urea-formaldehyde resin.

Thus a positively recited, operative step of the process is applying an adhesive binder to a wood material. The process “as claimed” thus cannot be used to make an article out of sand. The justification for the restriction requirement is not valid. The process is limited to making a wood composite using the claimed binder composition which is the subject of the elected invention of Group I. The requirement of restriction should be withdrawn and all claims considered in this application.

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Amendments

Claims 1 and 16 have been amended to recite the substance of claims 7 and 14 respectively, *i.e.*, the claims have been amended to indicate that the protein is added during the synthesis of the UF resin to maximize the reaction between free formaldehyde and protein. Claims 8 and 17 as originally filed were dependent on claims 1 and 16, thus their dependency had to be corrected. By this amendment these claims are effectively returned to recite what was embraced by the original dependency.

Claims 9 and 18 also have been amended, consistent with the disclosure at paragraphs [22] and [23]. As disclosed, the initial synthesis of the resin is generally done at a F:U mole ratio in the range of 1.5:1 to 3.2:1 (paragraph [22]). When preparing the adhesive, additional urea generally is back-added to reduce the U:F mole ratio to within the range of 0.6:1 to 1.4:1 (paragraph [23]).

No new matter has been added as a result of these amendments.

Entry of the amendments is requested.

The Invention

The present invention is based on the discovery that by reacting a protein into a urea-formaldehyde resin during its preparation a wood composite adhesive is produced that has enhanced tackiness (see especially paragraphs [36] and [52]). One of the benefits of enhanced tack, as appreciated by those skilled in the art, is that in many cases where the level of resin usage is limited by the prepress strength of the composite before heat/pressure consolidation, a lower level of resin usage is possible as the tackiness of the resin is increased. Thus, rather than using the same amount of resin to potentially obtain an increased internal bond (IB) strength, especially where an increased IB is not needed, one can instead use a smaller amount of resin to obtain a satisfactory bond strength, since with the tackier resin the smaller amount is able to provide a pre-pressed composite board with sufficient strength for handling prior to final consolidation. In this way there is a significant cost savings as the overall level of resin usage is reduced.

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The Rejection of Claims 1, 2 and 5-9 under 35 U.S.C. § 102(b)

Claims 1, 2 and 5-9 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Tinkelenberg et al (U.S. 4,282,119). Applicants respectfully traverse this rejection.

For any reference to serve as an anticipation of a claimed invention, the reference must teach each and every limitation of the claimed invention. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 58 USPQ2d 1286, 1291 (Fed. Cir. 2001). In that regard, Tinkelenberg fails to teach or even suggest the presence of the protein during resin synthesis so that there is a reaction of the protein during the preparation of the resin.

Tinkelenberg discloses that the addition of a protein which is dissoluble or dispersible in the resin solution has a positive effect on the weather resistance of the chipboard, if the resin has a low F/NH₂ molar ratio, *i.e.*, 0.45 to 0.65. Tinkelenberg also teaches that there is no advantage to using protein addition generally since with the commonly used adhesives, *i.e.*, resins made at an F/NH₂ molar ratio of between 0.70 and 0.85, the addition of a protein produces only a limited non-essential improvement. Clearly, there is no recognition that the addition of a protein under proper conditions improves resin tack.

As recognized in the Office Action, Tinkelengerg describes using protein which is dissoluble or dispersible in the resin solution. Suitable proteins are albumins such as blood albumin desiccated blood, globulins, casein, hydrolized sludge from effluent water treatment plants and, possibly, partially hydrolized cell material obtained from cultures of micro organisms. In view of its price and availability Tinkelenberg preferred blood albumin. Importantly, Tinkelenberg teaches only that the protein is mixed into the resin solution shortly before processing and distributed uniformly by stirring. Tinkelenberg suggests that in most cases the protein need only be dispersed in the solution. There is absolutely no suggestion of reacting the protein with formaldehyde during the actual synthesis of the resin. The resin actually is prepared separately (see especially column 2, line 39 to column 3, line 19) before the protein is added. See especially Example 1.

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Since Tinkelenberg fails to disclose or suggest an essential limitation of the claimed invention, Tinkelenberg cannot anticipate any of the pending claims.

The Rejection of Claims 1, 2 and 5-9 under 35 U.S.C. § 103(a)

Claims 1, 2 and 5-9 also have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tinkelenberg et al (U.S. 4,282,119). Applicants respectfully traverse this rejection.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (emphasis added).

Again, for reasons discussed in connection with the anticipation rejection, Tinkelenberg neither discloses, nor suggests that there is any benefit to adding the protein at the time of resin synthesis. Adding the protein to a previously synthesized resin does not make it obvious to add it at the time the resin is prepared. Indeed, Tinkelenberg suggests that there is no real benefit to having any protein present at the preferred mole ratio for synthesizing the resin according to the present invention in any event, so why would one include the protein at all, let alone at a different time than described by Tinkelenberg. Tinkelenberg simply does not make applicants claimed invention obvious.

The Rejection of Claims 3 & 4 under 35 U.S.C. § 103(a)

Claims 3 and 4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tinkelenberg et al (U.S. 4,282,119) as applied to claim 1 above and further in view of Guilbert et al, U.S.Pub.App. 2004/0062920. Applicants respectfully traverse this rejection.

The secondary Guilbert publication discloses using a “powdery protein adhesive binder.” The published application describes using the powdery protein “as the sole binder component” and thus the essential U-F resin constituent of the present invention (and of the primary reference) is nowhere mentioned. There is nothing in the disclosure of the Guilbert publication suggesting its combination with Tinkelenberg. Guilbert has been selected inappropriately by virtue of an improper hindsight evaluation of the pending application.

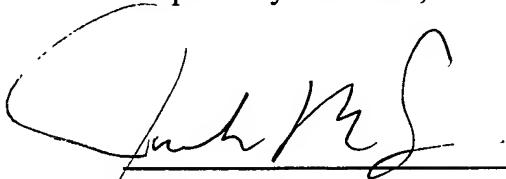
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Nothing in Guilbert suggests that any of its teachings should be combined with Tinkelenberg. Moreover, even when viewed in combination, none of the subject matter embraced by the pending claims is rendered obvious. Nothing in either reference suggests that an advantageous tack improvement for a wood adhesive could be obtained if the protein is present during the initial synthesis of the U:F resin. The Guilberg reference having failed to teach anything at all about U:F resins, clearly does not make obvious the subject invention dependent on the presence of the protein during the resin synthesis.

CONCLUSION

Accordingly, in view of the above amendments and remarks, this application is believed to be in condition for allowance, and a written indication of the same is respectfully requested.

Respectfully submitted,



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